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United States and/or Canada. Some critics might argue that it could have been obtained in Siberia or China, for example and brought to America for display. This would not be a serious problem for at least two reasons.

First, simply proving the creature's existence at any location is the biggest point that has been located by the sceptics, and that point would have been won. Second, the mass of reports of creatures closely matching this description in America is so great that few people would seriously dispute the claimed location in general, though the exact spot might be disputed. In addition, the actual circumstances of the acquisition would probably be too impressive to conceal, especially if it is the whole body, and the act of bringing it from a distant location would be equally difficult to conceal.

Producing the remains of a puma, claimed to have been shot in Virginia, would be summarily dismissed by most authorities. The sceptics would immediately say that it had most likely come from some other location where the existence of the puma is not questioned. The burden of proof would be on the collector to show where it was taken. Reports of the eastern puma are not nearly as impressive as those of the sasquatch - there would be little support from local accounts simply because it is not a new animal. The actual circumstances of acquiring such a small animal would not be easily demonstrable, especially if it is just the skull, and the act of bringing it in from a not-so-distant location could have been easily concealed.

In the United Kingdom we have two comparable examples of these same second and fourth categories.

The Loch Ness Monster is a case of 'unexpected morphology'; the retrieval of a specimen would almost certainly demonstrate its existence, as well as show just what kind of a creature it is.

Whether such a specimen was actually from Loch Ness is less important than proving the reality of an animal of this type (whatever that might be). Also, the long history of sightings at that location would strongly support the claim of where it was taken. Finally, its presumably large size would make it difficult for anyone to argue that it was brought in from some distant source. Accordingly, it can be argued that (hopefully) unemployed whalers.

efforts should be made to retrieve such a specimen by any and all possible means - perhaps harpooning by

The beast of Exmoor is a case of 'unexpected place'; the retrieval of a specimen would not demonstrate the existence of this feline species, simply because that was generally not an issue of disagreement. The history of sightings might support the claim of where it was taken, but not strongly; there are far better accounts of large black cats from elsewhere. Also, parts of black leopards, or melanistic pumas may be small enough to bring into the country without great difficulty. Finally, the possibility exists that such an

kill or even capture a specimen of this type.
animal had recently escaped from captivity. Accordingly, it can be argued that no effort should be made to
There are many other aspects to the problem of whether and how to collect cryptozoological specimens.
Perhaps the readership's reaction to this article will determine if and what I might address in another article.
The author and the editor welcome comments on this article for
inclusion in the letters page of a future issue.
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CRYPTOCETOLOGY:
Introducing a new branch of Cryptozoology
(Part one of a seven part series in which Darren Naish explores the world of mystery whales)
How mysterious are whales? It depends on how much you know about them! The more you know, the greater the number of enigmatic whales you will learn about. This might be a bit of a strange idea to begin
animal groups well established in the dogmas of zoology aren't immediate candidates for prominence in the annals of cryptozoology. Sea serpents and almas, (maybe batsquatches and mothmen)
come to mind, yes, but whales?
with
On the 16th September 1994 I opened a book by travelling naturalist Sir Peter Scott ("). There, on page 254,
were his illustrations of a species of dolphin that he saw in the Magellan Straits in 1968. I didn't recognise
them as being members of any known species and, after consulting the literature, had to consider the possibility that here was a 'new' species of dolphin, lying undiscovered in a book printed in 1983. This was an exciting concept that really got me enthused, and I began researching in carnest. The find was, as it
turned out, somewhat of an ice-berg tip. Within a very short time available literature was revealing a veritable wealth of whale species which had been seen, sometimes even photographed, but were as yet
unknown from specimens. Heuvelmans recognised eight species on this basis, but more seemed to be present. The more I looked, the more I found, and what started as a project involving a single illustration in
a single book metamorphosed into a number of interrelated topic areas, quite extensive amongst cetology
(the study of whales) in their coverage.
Was this news? I think that it would depend on who you asked. Whales are marine, mysterious and clusive; for as long as cetology has been a science, the cetologists have been hinting at what I call 'habitat-
induced elusiveness'. Whales are merely proving the bias there is against the discovery of marine forms,
for, if you spend a greater proportion of your life beneath the surface of the waves, mankind has not yet gotten much of a chance to get to know you. Of course, not only is this proven by as-yet-undiscovered species, modern species that have remained unknown (or practically so), until very recently endorse it also.
Case studies for this are well known and in some cases becoming more so; such as the coelacanth, megamouth, even certain whale species themselves. Good old-fashioned elusive species proving more

diversity amongst living forms than we'd anticipated, aren't, however, the entire story. These fascinating animals will be covered in article four, whereas Scott's mystery Dolphin will be covered in article two. This topic is large enough to be considered as a subject in its own right. I have coined the name CRYPTOCETOLOGY, merging the study of whales with the principles that we have learned (or 'have yet to learn') from cryptozoology. This first article is mainly a primer to familiarise you with names and ideas which will be introduced in successive articles. To begin with, therefore, a basic introduction to the
diversity amongst whales, and the evolution which has lead to this diversity is in order. I hope that you find it as interesting as I do.
The Evolution of Whales and the cryptocetological aspects therein.
The great whales and their smaller cousins form a mammalian group that we call the Cetacia, or, in common parlance just Whales. Awe inspiring, beautiful, colourful and often damn weird, these amazing creatures have adapted themselves to a realm so different from our own that they function in ways that we
are still struggling to understand. Whales are a diverse group of animals and, when we consider the extinct

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The present opinion is that the Cetacea are monophyletic, which means that they all share the same single
ancestor. (There have been dissentions (4) 0). This single ancestor, one of the mesonychids (. (omnivorous
wolf-like ungulates), was an amphibious, fish eating mammal that took to an aquatic lifestyle during the carly Eocene, about 50 Million years ago. On acquiring characters that we now use to define 'whale' these animals therefore became the first whales. They are called protocetids and, while very different from
the fully aquatic whales that would be their eventual descendants, did enjoy success in the seas and estuaries of the world. A protocetid, as the recently discovered Ambulocetus natans, has shown, would have looked something like a long snouted sea-lion (figure onc). While protocetids were ancestral to later
whales, they may well have been a more explicit cryptozoological link! (I will keep you in suspense until article three). (There are I have to say, other theories on the origin of whales, some of which directly challenge the evidence presented here. These will be discussed in a future article).
PLEISTOCENE
1-6
PLIOCENE
5.3
STEAM WHALES
CETOTHERMBAS
NOTE
36-5
23
OLIGOCENE
MIOCENE
COONTOCETI

+KYSTICETI
DELPHIND DEA
Fig. 1. Ambulocetus natans, a 49 million year old protocetid whale from the Upper Kuldana formation In Pakistan.
Note the presence of fur and the abscence of tail flukes.
On becoming more specialised, and generally better adapted to a marine existance, protocetids became
basilosaurids. These whales are best known for Basiliosaurus, a 20 metre-or-more long form from the late
Eocene. It and its relatives, long known as zeuglodonts also turn out to have more than their fair share of
cryptozoological importance and thus also get fuller discussion in article three. Both protocetids and zeuglodonts (and a few other poorly known Eocene families) are lumped together as 'archacocetes'. histories begin in the Oligocene (see fig 2).
basically whales that lack the specialisations used to identify the two later whale groups whose respective
The Rise of Modern Whales.
All post-archaeocete whales are separated into those with teeth - the Odontoceti - and those with baleen
(whalebone) instead of teeth - Mysticeti. Both groups arose from within the Archacoceti, independently, some have maintained (5). (9). (10), but there is now at least some molecular evidence suggesting that
-20-
53
65 MILLION
YEARS AGO
EOCENE
PALA FOCENE
PROTOCETION
CETACEA
Figure 2. A phylogeny of cetaceans based on currently recognised ideas. Based mostly on Folkens and Barnes (
with additional material from (15) and (). The llanocetids are too poorly known for a restoration, the two figures for the
Protocetidae represent the morphological variation known in that family. No figures are to scale.
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mysticetes share an ancestor with odontocetes. The first toothed whales, relatives of forms like Squalodon
(fig 3), appeared early in the Oligocene (11), about 37 million years ago as shown in fig 2, and by about 30
million years ago had given rise to four lineages. Those leading to sperm whales (physeteroids), beaked
whales (ziphoids), river dolphins (platanistoids) and typical dolphins, (delphinoids). During the Miocene (23-5.3 million years ago), the basic dolphin design, exemplified by the delphinoids, was successfully adapted to life in polar regions, rivers, and both deep water and shallow marine areas. Three families of the
Delphinoidea survive today and, as illustrated in fig. 4 encompass the greatest variation amongst living whalcs.

Fig 3. A generalised squalodontid (c.f Prosqualodon). This family was most abundant from the Oligocene to early
Miocene times, and were amongst the earllest and most primitive of odontocete whales. After Folkens (2)
Delphinoids range in size from the 36 kilo mass and 1.35 metre length of the smallest to the 8 tonnes and
9.75 metres of the biggest. Some, arguably the most exciting of all whales, are active and ferocious predators of other whales. At least one, the Orca (Orcinus orca), is a co-operating pack hunter. Nearly all
members of the delphinoid clan have a dorsal fin - one enigmatic species may even have two (15). and one,
the fabled Narwhal (Monodon monoceros) of the high arctic, has a 'horn' (really an incisor tooth). A recently discovered relative of the narwhal from the Pliocene of Peru, (Odobenocetops was a cetaccan mimic of walruses. It even had tusks.
(13)
The evolution of a sophisticated sonar system has allowed whales, delphinoids among them to exploit environments where other senses, like sight, were not usable. A number of lineages seem to have independently invaded muddy rivers, and are today represented by eight species of river dwelling dolphin.
Five of these species are the superficially similar, poorly sighted platanistoids (see figs 2 and 4). For a long time they were thought to represent a single, specialised lineage, but it now seems that some, at least
evolved independantly of the others. Their marine ancestors are known from carly in the Miocene and possibly invaded river systems because they were a habitat largely unexploited by large, aquatic vertebrates at the time. Mainly due to this newer habitat, though their clusive behaviour certainly helps, the
living examples of this group are very poorly known and continue to tantalise us with an abundance of mystery forms, some only just revealing themselves to the eyes of man. These will be dealt with in article
five.
The Oligocene period seems to have been the time of greatest divergence amongst whales (11). The other
extant groups evolved at this time also. DNA evidence presented by Milinkovitch and colleagues in 1993
(17)
suggested that mysticetes diverged from sperm whales about twelve millionyears ago, during the mid-late Miocene. However, a number of fossils, both of early mysticetes and of sperm whales are known from
the early Oligocene (35 million years ago) (11) (18), casting doubt upon this hypothesis. A new and more
thorough genetic analysis published in 1994 demonstrated that not only are mysticetes monophyletic, they
are far removed from sperm whales who seem to have evolved from other odontocetes early on in odontocete history.(14) (see fig 2). Though they have now been effectively challenged Milinkovitch and

Figure 4. Some of the diversity amongst the delphinold superfamily with one representative platanistold (river
dolphin). a) Orca, a 'globocephalid). b) Narwhal, representing one subfamily of the Monodontidae; c)

Snubfin
(Orcaella brevirostris), probably a monodontid also; d) Hourglass Dolphin (Lagenorhynchus cruciger); e) Northern
Rightwhale Dolphin (Lissodelphis borealis)); 1) Pygmy orca (Feresa attenuata)), another 'globocephalid''; g) New
Zealand Dolphin (Cephalorhynchus hectori)); h) Spinner (Stenella longirostris); 1) Ganges dolphin (Platanista
gangetica), a platanistid river dolphin; D Spectacled Porpoise
(Australophocaena dioptrica) of Phocoenidae; k) Roughtooth (Steno bredanensis). Common names adapted from
(10)

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colleagues' DNA findings were really something of a surprise, as mysticetes were always thought to have
been derived from carly Oligocene archacocetes. (Mammalodon, fig 5, seems like a good 'missing link', though it was actually something of a 'living fossil' of its time (19). Sperm whales were long thought to have been allied to the beaked whales, or ziphoids, but this link is now fairly unanimously severed.
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Figure 5. Mamma lodon colliveri, a late Oligocene whale from Victoria, Australia. It is intermediate between archa coceles and
mysticetes
The three (known!) species of sperm whale are probably best regarded as two separate families (21). Kogiids, the pygmy sperm whales, extend back as far as the late Miocene and may be descendants of the
physeterids, today represented only by the Great Sperm Whale (Physeter macrocephalus). The earliest known physeterids are from the early Miocene (contradicting, incidentally, the conclusions of Milinkovitch and colleagues) (14) (18). The sperm whales acquired numerous unique features during their
evolution and together these features make Physeter the weirdest mammal that has ever existed (in my opinion of course). Feeding as it does on giant squid, Physeter is probably more linked to cryptozoology than any other known whale. The final article in this series will cover Physeter and all of the associations it
has with the cryptic world, whereas the article before will feature Physeter's pygmy cousins together with
the other species that have only been discovered in relatively recent times.
To many cryptozoologists, the animals that immediately spring to mind when whales are mentioned are the ziphoids the beaked whales. This group is known from the mid Miocene onwards. They share asymmetrical skulls and 21 pairs of chromosomes (as opposed to 22) with the physeteroids, but it now seems that the two groups are no more related to each other than they are to other odontocetes. An alternative suggestion is that ziphoids are the descendants of an carly Miocene family called the Squalodelphidae (see fig.2). Modern ziphoids are relatively conservative, mostly deepwater forms, (though
they did evolve freshwater forms in the past) that range from 4 to 12.8 metres - like some other cetacean
groupgs they have a tendancy towards toothlessness. The 19 or so species are the most poorly known of
all large mammals with several known only from bones. Others, known only from beached corpses,

also
have yet to be seen alive. One species may play a part in the story of a reptilian sea monster
02) (23) and still
others form part of my fourth article, that on whales reported from sightings but as yet unknown from
any
specimens.
Diversification of the Mysticetes.
Mysticetes, the baleen whales, were extremely successful in the Oligocene, Miocene and lower
Pliocene,
and although today represented by four families (some say three), are less successful in terms of
species
numbers than they were. Small mysticetes, called cetotheres, comprised at least sixty species of
moderate

99
Figure. 6. Some of the variation amongst the bigger whales, representing five of their seven families; a)
Humpback
(Megaptera noveangliae) and b) Fin whale (Balaenoptera physalus) - representing both traditional
rorqual
subfamilies; c) Great sperm whale sole living member of physeteridae; d) Pygmy right whale - only
living
neobalaenid; e) Skew beaked whale (Mesoplodon hectori) and f) Northern bottlenose whale
(Hyperoodon
ampullatus), both of Ziphiidae, finally; g) Right whale (Balaena glacialis) represents Balaenidae.
Common names
adapted from (10).

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sized whales during this time of greatest success. Those that lived in the Pliocene were eaten by the 13
metre long giant shark Carcharadon megalodon (but that's another story!). Mysticetes today are mostly
enormous filter feeders that sieve plankton and other small fare. To confuse matters, the unususal, and
very
mysterious Pygmy Right Whale (Caperea marginata) is only about five metres long, which is smaller
than
the biggest of the delphinoids we saw earlier. The Pygmy Right Whale has almost succesfully cluded
science since its official recognition as a species in 1846. More about this in article six.
Pygmy right aside, baleen whales come in three definite groups. The strangely ugly Grey whale
(Eschrichtius robustus), once thought to be a direct descendant of the cetotheres, is typically regarded
as
occupying a family of its own. However, it may in fact be a recently evolved, very specialised rorqual
(read on). The bulky, slow moving balaenidae or right whales - the whales hunted so extensively in the
past form the second family. They seem to have been the first group of living mysticetes to have
appeared, and did so probably in the mid Oligocene (11). Following balaenids, the group I call the
Neobalaenida evolved, with the pygmy right wales appearing first. Finally, with the earliest known fossil
species coming from the mid Miocene, there are the balaenopterids or rorquals, the real giants with
lengths
up to 31m and masses of 200 tonnes for the very biggest-the Blue Whale (Balaenoptera musculus),
biggest
animal of all time. (Please note that some recently revealed sauropod dinosaurs may eventually win the

'largest vertebrate ever' title 5) 26)). Rorquals are either sleek and streamlined (at least five species) or stout and bulky (the Humpback being the only member of that second group).(See fig. 6). Rorquals have
traditionally been segregated into two sub-families on that basis 4). Some new genetic evidence, however
suggests that the rorqual family tree is in need of revision. As the issues here are coupled with interpretation of variation amongst some of the rorqual species, this area will get fuller discussion in article
five.
There isn't exactly boggling diversity amongst the giants, unlike the smaller whales but perhaps surprisingly these whales are confusing in terms of variation amongst them: EXACTLY how many species
are there? Which ones are definitely species? When we are that confused about such conspicuous and well
known species as the Humpback and the Blue Whale then there is definite scope for an investigation into
'hidden' forms,
Cetacean systematics.
This brings me onto what is called systematics - a subject that does not just apply to the great mysticetes
but to all of the smaller whales too. Within practically all species of whale there does seem to be at least some variation between populations. In the past, practically every one of these varieties was named as a
separate species, so the modern count of seventy six species is in fact a very 'slimmed down' up to datecount. Whether or not a certain variety of a certain species is different enough from others of the species to be considered a species in its own right is a very contentious subject - for that reason exactly how many species there are depends on who you ask. Article five will be on this subject - it has a bearing
on cryptozoology because there may be 'new' species out there currently unrecognised, maybe thought of
as part of as part of another species due to lack of significant research and the right comparisons. The confusion that this issue and the others like it cause when we begin to look at whales in detail is considerable.
Hopefully, you may get to understand this in my next article; "The Page 254 Story".
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